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THE UPWARD TREND OF CANCER MORTALITY

In 1925 the Metropolitan Life Insurance Company published a detailed study of the mortality from cancer among its Industrial policyholders, over the period of years from 1911 to 1922, inclusive. Meanwhile further data have become available, and it is possible now to extend the trend lines of cancer mortality so as to include also the years 1923, 1924 and 1925. An analysis of the material thus collected, and computed for three age groups, namely, ages one and over, 25 and over, and 45 and over, leads to the following conclusions:

1. There has been an unquestioned upward trend in the total mortality from cancer. The annual rate of increase was 4.27 per 100,000 exposed to risk in the age group 45 and over, 1.66 per 100,000 in the age group 25 and over, and 0.82 in the age group one and over. Expressed in per cents. of the mean rate during the entire period these annual increases are 1.13 at ages 45 and over, 0.94 at ages 25 and over, and 0.93 at ages one and over.

2. When the total deathrate is split up according to color and sex, the heaviest share of the increase is seen to fall on white males ages 45 and over, with an annual increase of 6.70 per 100,000 or 1.88 per cent. of the mean rate for white males during the period. Next in order come colored males, with an absolute increase, in the age group 45 and over, of 5.19 per 100,000 per annum, or a per cent. increase of 2.90. It is to be noted that whereas the absolute increase among colored males has been less than among white males, the relative increase has been greater. Among white females the increase, at ages 45 and over, was 2.39 per 100,000 per annum or 0.56 per cent. of the mean rate and among colored females 1.95 per 100,000 or 0.56 per cent. Except for cancer among colored females, all the increases mentioned above are significant, that is, the figures for

the slope of the trend line are greater than could reasonably be assigned to accidental fluctuations.

3. This general increase in the total deathrate from cancer reflects the fact that, with only a few exceptions, the rates for cancer of different organs considered separately, show, each by itself, an upward trend. The few exceptions are as follows: Cancer of the skin has shown a *downward* tendency in all age, color and sex groups, except among colored females, where the numbers of deaths are small, and the figure for the trend correspondingly unreliable. In this particular group there is an upward trend, not sufficient, however, to be regarded as significant. The other exceptional cases, exhibiting a *downward* trend, are cancer of the buccal cavity among females, both white and colored. Among males there is a slight upward trend for both white and colored, in all three age groups, but in no case is the rise significant in deathrates from cancer of the buccal cavity. The only other category in which a downward trend is observable is cancer of the stomach and liver, white females, all age groups. Here also the slope of the trend is not significant.

4. Significantly upward trends are shown for cancer in the following locations and groups: Cancer of stomach and liver, total Industrial Department, white males, and colored males, in each case in all three age groups. As already remarked, females seem to be essentially exempt from this increase. Cancer of the peritoneum, intestines and rectum also shows significant increase in all age groups in the total Industrial Department, white males, white females, and in colored females at ages 25 and over and 45 and over. Cancer of the breast rarely occurs in males. Among white females it has shown a significant increase in all three age groups. Among colored females the figures show an increase, which, however, is not significant.

5. The last category, "cancer of other organs or organs not specified," shows a significant increase for all age groups, and for all color and sex groups, except colored females.

6. It is noteworthy that all trends that are *significant* are upward trends, and conversely, all of the *downward* trends are *insignificant.*

7. The policyholders to whom this study relates number, at the present time, about seventeen millions. All deathrates on which these conclusions are based are corrected to a standard age distribution.

The table on page 3 presents the essential results of the investigation into cancer incidence 1911 to 1925 inclusive.

Trend of Cancer Deathrates 1911 - 1925, Metropolitan Life Insurance Company, Industrial Department.

	AVERAGE ANNUAL INCREASE OR DECREASE 1911—1925									
	TOTAL—INDUSTRIAL DEPARTMENT		WHITE				COLORED			
			MALES		FEMALES		MALES		FEMALES	
	Absolute, in deaths per 100,000 per year	Percentage of average deathrates 1911-1925	Absolute, in deaths per 100,000 per year	Percentage of average deathrates 1911-1925	Absolute, in deaths per 100,000 per year	Percentage of average deathrates 1911-1925	Absolute, in deaths per 100,000 per year	Percentage of average deathrates 1911-1925	Absolute, in deaths per 100,000 per year	Percentage of average deathrates 1911-1925
CANCER—ALL FORMS:										
Age 1 and over	**.821±.09**	**.93**	**1.345±.10**	**1.75**	**.286±.13**	**.27**	**1.155±.19**	**2.83**	.415± .24	.44
45 and over	**4.267±.48**	**1.13**	**6.703±.72**	**1.88**	**2.391±.61**	**.56**	**5.192±.98**	**2.90**	1.948±1.15	.56
CANCER OF BUCCAL CAVITY:										
Age 1 and over	.016±.06	.44	.053±.03	.77	*−.008±.01*	*−.70*	.024±.05	.84	*−.051± .03*	*−3.67*
45 and over	.084±.10	.49	.248±.18	.74	*−.021±.07*	*−.43*	.100±.24	.77	*−.185± .18*	*−3.41*
CANCER OF STOMACH, LIVER:										
Age 1 and over	**.167±.06**	**.49**	**.437±.10**	**1.21**	*−.104±.09*	*−.30*	**.449±.09**	**2.15**	.023± .11	.10
45 and over	**1.061±.28**	**.68**	**2.389±.50**	**1.38**	*−.137±.31*	*−.09*	**2.215±.47**	**2.33**	.309± .50	.33
CANCER OF PERITONEUM, INTESTINE, RECTUM:										
Age 1 and over	**.205±.03**	**1.90**	**.206±.05**	**2.12**	**.259±.05**	**1.91**	.068±.06	1.43	.145± .08	1.75
45 and over	**1.019±.16**	**2.13**	**1.384±.26**	**3.11**	**1.158±.27**	**2.01**	.298±.28	1.53	**.741± .34**	**2.56**
CANCER OF THE FEMALE GENITAL ORGANS:										
Age 1 and over	.016±.03	.11	.....	.....	.011±.05	.04	.....	.....	.176± .12	.47
45 and over	.198±.11	.36	.....	.....	.318±.20	.32	.....	.....	.710± .45	.56
CANCER OF THE BREAST:										
Age 1 and over	.043±.02	.59	.....	.....	**.106±.05**	**.76**	.....	.....	.035± .10	.22
45 and over	**.296±.12**	**1.00**	.....	.....	**.659±.21**	**1.21**	.....	.....	.241± .46	.39
CANCER OF THE SKIN:										
Age 1 and over	*−.031±.02*	*−1.17*	*−.036±.05*	*−1.07*	*−.040±.03*	*−1.68*	*−.022±.03*	*−2.34*	.039± .03	3.80
45 and over	*−.150±.10*	*−1.20*	*−.160±.21*	*−.96*	*−.200±.12*	*−1.80*	*−.141±.15*	*−3.51*	.160± .13	3.85
CANCER OF OTHER ORGAN OR ORGANS NOT SPECIFIED:										
Age 1 and over	**.418±.05**	**2.84**	**.698±.07**	**3.48**	**.183±.06**	**1.63**	**.618±.08**	**5.42**	.077± .09	.92
45 and over	**1.848±.25**	**3.09**	**3.259±.34**	**3.70**	**.795±.28**	**1.91**	**2.583±.36**	**5.55**	.100± .38	.34

Figures preceded by the sign ± are *standard* errors; figures in italics indicate declines; bold face figures show *significant* changes.

A COMPARISON OF DEATHRATES FOR TUBERCULOSIS, BY AGE GROUPS IN THE INDUSTRIAL AND GENERAL POPULATION

In spite of the organized and very successful campaign which has been waged against tuberculosis during the current century, and which has been instrumental in halving the deathrate in the short period since 1906, tuberculous disease still ranks high, in fact, fifth in numerical importance among the causes of death. Obviously, there is still much to be accomplished in this direction.

As a contribution to the anti-tuberculosis movement, the Metropolitan Life Insurance Company submits a recently completed study showing the incidence of the mortality from tuberculous disease, in 1924, among its white Industrial policyholders, by sex and age, as contrasted with the figures for the same year in the United States Registration States. The insurance experience is a sensitive index of what is transpiring among the urban wage-earners of the country, their wives and children; the data for the Registration States reflect conditions in the general population of the country.

The charts on page 5 present some very startling differences. That for white females shows that in both the wage-earning group and in the general population, the maximum deathrate for tuberculosis is reached between 20 and 24 years, and that the rates run somewhat higher for the insured group up to the age period 15-19. From this point on, to the age period 55-64, women in the industrial population show a considerably higher deathrate than do those in the general population; the largest difference being that for the age group 20-24 years; furthermore, subsequent to ages 55-64, the tuberculosis deathrate increases in the general population—sharply at first, and then slightly—whereas among women in the industrial group, the general tendency is downward.

Among white males the picture is very different. Both the industrial and general population curves conform closely up to the age group 20-24 years. After age 25, however, the divergence is much more marked than for the females. The industrial population rate rises sharply in each succeeding age group to reach its peak at 45-54 years, then declines sharply to 65-74, and rises a trifle thereafter. The general population curve, on the other hand, shows a generally rising tendency, does not reach its maximum until the age period 65-74 years, and then declines sharply.

The outstanding differences are: that the high point in the tuberculosis deathrate in the white male industrial population in 1924

DEATHRATES FROM TUBERCULOSIS (ALL FORMS) 1924
WHITE PERSONS BY SEX
Metropolitan Life Insurance Company – Industrial Department and United States Registration States of 1920 Compared
WHITE MALES
WHITE FEMALES
DEATHRATE PER 100,000
METROPOLITAN
U.S. REG. STATES
AGE
STATISTICAL BUREAU - F.M.T.

was reached 25 years later in life than for the females; that at the very period of life when there is the sharpest drop in the rate curve for females, there is in evidence a rising rate for males, and that the mortality among white male wage-earners in the industrial population, between the ages of 20 and 60 years, is very much higher than among those in the general population, in the corresponding age range.

The chief value of these figures, in our judgment, lies in the fact that they point very clearly to the effect of the environmental, and especially of the occupational factors which condition the physical welfare of the great army of male wage-earners at the very time in life when they are the most productive; when the greatest number of persons are dependent upon them for support, and when their deaths (which usually follow long periods of illness) most seriously affect the immediate family life and the life prospects of their children. The place for concentrated effort today to control the tuberculosis deathrate, is with the middle-aged industrial wage-worker. Aside from the gains attending the reduction of the deathrate, there would, in thousands of cases, be eliminated, problems that otherwise would ultimately come to social agencies for their solution.

DEATHRATE FOR ORGANIC HEART DISEASE AMONG THE INDUSTRIAL POPULATIONS OF AMERICAN STATES AND CANADIAN PROVINCES

The general tendency of the deathrate from heart disease among the industrial population of the cities of the United States and Canada has been upward since the year 1919. The figures for the ten months of the current year indicate, moreover, that a larger year-to-year rise will be registered in 1926 than has been recorded for any of the three years immediately preceding. At the end of October of the present year, the heart disease deathrate among more than seventeen million Metropolitan Industrial policyholders was 133.3 per 100,000; for the same period of 1925 it was 127.4; the increase was 4.6 per cent.

Heart disease, for many years, has been the leading cause of death. Obviously, it has had much to do with determining the total deathrate of every community. The mortality records confirm this. In the July STATISTICAL BULLETIN we showed the states recording the five highest all-cause deathrates among white Metropolitan industrial policyholders, in 1925; these are with a single exception, the same ones which showed the highest heart disease deathrates. The four states are New York, Maryland, New Jersey

and Pennsylvania, and the state which registered the fifth highest heart disease rate (Rhode Island) ranks sixth highest in its general deathrate. As might be expected, it also develops that the American states and Canadian provinces which registered low general death-rates among their urban industrial populations also, by and large, recorded low rates for organic heart disease.

Figures for the several broad geographical regions of the United States and Canada show that the highest deathrate for cardiac disease in 1925 (161.7 per 100,000) was that for the Middle Atlantic States. No other region even closely approached this figure. New England, with the much lower rate of 123.9, stands next in order. In New England, it is interesting to note that the three highly urbanized states, Massachusetts, Connecticut and Rhode Island, recorded very high cardiac disease mortality both among the urban wage-earning population and the general population, including both cities and rural districts; but that on the other hand, Vermont, New Hampshire and Maine, where most of the people live outside of the cities, all show very much below-average heart disease deathrates among their urban wage-workers, as compared with absolutely the highest for either the United States or Canada in their populations, as a whole. This striking difference very probably reflects a wide divergence in the age distributions of the urban and rural dwellers.

The third highest regional deathrate for heart disease was that for the South Atlantic States (104.2). The relatively unfavorable record for this group is due entirely to Maryland and the District of Columbia, as the rate for heart disease in each of the six other states was well below the average. Despite the fact that this region has the third highest rate among the broad geographical areas, its mortality is still well below the average for the urban industrial population of the United States (121.1).

In all of the remaining groups of states and provinces the mortality from cardiac conditions was very much below the average for the seventeen million industrial policyholders of the Company. The most favorable record was that for the Western Provinces of Canada where the extremely low deathrate of 44.5 per 100,000 was registered. The Mountain States had the second best record (53.5); and the Eastern Provinces of Canada (72.6), the Pacific Coast States (77.0), the East South Central States (79.5), the West North Central Group (86.0), the West South Central Region (90.6) and the East North Central States (95.4) followed in the order named.

Deathrates per 100,000 Persons Exposed. Organic Diseases of the Heart.‡ By Geographic Division, State and Province. Metropolitan Life Insurance Company, Industrial Department, 1925. (Excluding Infants under One Year of Age)

Geographic Division	Rates per 100,000	
	White	Colored
Total Company	117.0	213.6
United States	121.1	213.9
New England	123.9	236.7
Maine	72.1	*
New Hampshire	75.8	†
Vermont	70.6	†
Massachusetts	134.3	239.1
Rhode Island	139.7	*
Connecticut	128.1	203.6
Middle Atlantic	161.7	187.8
New York	177.5	206.2
New Jersey	149.4	165.5
Pennsylvania	142.7	181.7
East North Central	95.4	206.6
Ohio	104.5	168.3
Indiana	100.3	197.0
Illinois	99.8	223.5
Michigan	83.7	224.2
Wisconsin	67.3	201.6
West North Central	86.0	246.8
Minnesota	47.7	221.5
Iowa	65.5	167.0
Missouri	104.6	273.9
Nebraska	68.3	99.8
Kansas	72.3	232.4
South Atlantic	104.2	224.5
Delaware	104.9	154.3
Maryland	157.1	278.8
District of Columbia	140.8	240.4
Virginia	102.4	217.8
West Virginia	66.0	184.7
North Carolina	89.8	226.3
South Carolina	65.0	263.7
South Atlantic (*Cont.*)		
Georgia	55.5	197.0
Florida	73.5	126.4
East South Central	79.5	248.0
Kentucky	94.2	285.2
Tennessee	66.3	236.8
Alabama	81.1	140.1
Mississippi	38.0	*
West South Central	90.6	186.1
Arkansas	39.3	134.8
Louisiana	125.8	206.5
Oklahoma	33.6	181.1
Mountain	53.3	*
Montana	49.1	*
Idaho	25.9	†
Colorado	88.2	*
Utah	41.7	†
Pacific	77.0	172.9
Washington	41.0	208.9
Oregon	63.7	291.1
California	88.7	165.0
Canada	69.1	124.9
Eastern Provinces	72.6	*
Nova Scotia	96.4	*
New Brunswick	63.7	*
Quebec	64.8	*
Ontario	82.7	*
Western Provinces	44.5	*
Manitoba	58.3	†
Saskatchewan	49.4	†
Alberta	32.2	†
British Columbia	39.4	*

*Deathrate not calculated on account of small number of colored policyholders.
†No deaths.
‡Does not include acute endocarditis, acute myocarditis, pericarditis and angina pectoris.

The lowest rate for any individual state or province was that of the urban wage-earning population of the cities of Idaho, 25.9 per 100,000. The Province of Alberta had the next most favorable

record followed in order by Oklahoma, Mississippi, Arkansas, British Columbia, Washington, Utah and Minnesota.

Comparison of the mortality from heart conditions among the Canadian urban industrial population with that for the same group in the United States shows that the deathrate in Canada runs only a little over half that which obtains in the United States.

All of the rates quoted in the foregoing text relate to white persons only. The mortality from organic heart disease among the colored is almost double that for the whites. These figures for the whites, however, as quoted, do not reflect the true hazard of dying from heart disease, in each area, so much as they do show the effect of the differing age distributions among policyholders in the various states of the Country. Where, as often happens, the bulk of the insured are young people, the rates, on this account alone, will be lower than where there is a larger proportion of older persons.

HEALTH RECORD FOR OCTOBER, 1926

The health situation in the Industrial populations of the United States and Canada showed improvement in October as compared both with the same month of 1925 and with the preceding month of 1926. The recorded deathrate (7.9 per 1,000) shares with October, 1921 and 1922 the distinction of being the lowest ever recorded for October. In 1925 the rate was 8.1; in 1924, 8.5; and in 1923, 8.8.

At this season of the year, special interest always attaches to what is happening with respect to influenza and the respiratory diseases. This interest is somewhat accentuated at present by reports from different sections of the country which show, beyond question, that cases of influenza are increasing. Obviously, there is much concern as to the extent that this increased sickness is being reflected in the deathrate. We are able to report that up to November 13th, the records of the Industrial Department of the Metropolitan show nothing more than the expected, *seasonal*, rise in the deathrate from influenza and pneumonia. Among more than 17,000,000 persons exposed to risk, there were recorded, in October, 105 deaths from influenza, and 740 from pneumonia. The deathrate in October for these two diseases combined, was 55.6 per 100,000. This actually shows improvement over October of last year, when the rate was 60.1. Furthermore, in both the first and second weeks of November, the combined mortality from influenza and pneumonia was lower than in the corresponding weeks of 1925, at a time when no particular anxiety was being manifested about any impending outbreak of

influenza. Current low rates for heart disease, Bright's disease and cerebral hemorrhage also indicate that the kind of influenza now prevailing is not the virulent type.

The mortality from each of the principal epidemic diseases of childhood is low, although the diphtheria deathrate rose rather sharply from 6.5 per 100,000 in September to 10.5 in October; in October a year ago, it was 9.7. Tuberculosis, diarrheal diseases, and puerperal conditions show improvement over October, 1925.

In the field of deaths due to violence, suicides continue to be reported in unusual numbers, and if there is no slackening during November and December in the suicide rate, the figure recorded for the year 1926 will be higher than for any year since 1921; it may even exceed the rate for that year, in which event it will be the highest recorded since 1917. The homicide rate, in October, was a little lower than in September, and in October, 1925. Automobile fatalities were fewer than in October, 1925.

The general deathrate for the large cities of the United States during October was 11.5 per 1,000. This was a little higher than for the previous month, but slightly below the rate for October, 1925. As compared with September, there was increased prevalence of diphtheria, influenza, malaria, measles, poliomyelitis, and scarlet fever, but there were fewer cases of typhoid fever and whooping cough. Smallpox cases were reported in about equal numbers in each month. Comparison with October a year ago, however, shows increased prevalence of all of the diseases noted above, with the single exception of poliomyelitis.

Influenza cases have increased quite generally throughout the Country. In Georgia, 119 cases were reported for the first three weeks of October, as compared with 47 during the first three weeks of September. In Oklahoma, the corresponding increase was from 72 to 190. In the remaining states from which reports were obtained the increases were slight.

Diphtheria was much more prevalent in October. Increases were especially marked in Wisconsin, Indiana, and North Carolina. Outbreaks were reported from Atlanta, Ga., and from two small places in New York, Bennington and Scottsville.

Measles, which has been showing a declining tendency for several months, became more prevalent again in October. Scarlet fever cases were much more numerous in October than in September. In Minnesota, the number of cases rose from 227 during the first three

weeks of September to 505 in the corresponding weeks of October; and in North Carolina case reports increased from 90 to 279.

The following table shows the mortality among the Industrial policyholders for October, 1926; September, 1926; October, 1925; and the year 1925.

METROPOLITAN LIFE INSURANCE COMPANY

Deathrates* per 100,000 for Principal Causes, Premium-paying Business in Industrial Department (Annual Basis)

MONTHS OF OCTOBER, 1926; SEPTEMBER, 1926, AND OF OCTOBER, 1925

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED*			
	Oct. 1926	Sept. 1926	Oct. 1925	Year 1925
TOTAL—ALL CAUSES	785.8	814.2	813.3	907.5
Typhoid fever	6.2	8.4	7.1	4.6
Measles	1.3	1.9	.8	3.3
Scarlet fever	2.0	1.1	2.1	3.5
Whooping cough	6.1	9.0	7.2	7.7
Diphtheria	10.5	6.5	9.7	10.6
Influenza	6.9	4.6	6.7	22.0
Tuberculosis (All forms)	78.1	89.6	82.6	98.1
Tuberculosis of resp'y system	68.9	79.1	72.5	85.9
Cancer	69.7	72.8	66.0	70.5
Diabetes mellitus	13.9	15.1	14.0	15.2
Cerebral hemorrhage	46.4	46.1	44.0	53.6
Organic diseases of heart	106 7	105.1	105.8	126.6
Pneumonia (All forms)	48.7	36.3	53.4	86.5
Other respiratory diseases	11.0	9.0	10.3	13.2
Diarrhea and enteritis	49.3	63.6	61.9	36.7
Bright's disease (Chronic nephritis)	62.0	60.4	62.8	69.8
Puerperal state	11.8	11.5	12.6	16.5
Suicides	7.9	9.0	6.9	6.9
Homicides	6.3	6.5	6.8	7.2
Other external causes (excluding suicides and homicides)	58.0	68.5	64.7	64.3
Traumatism by automobiles	19.5	20.5	21.2	16.6
All other causes	183.0	189.1	187.8	190.7

*All figures include infants insured under one year of age.

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STATISTICAL BULLETIN,
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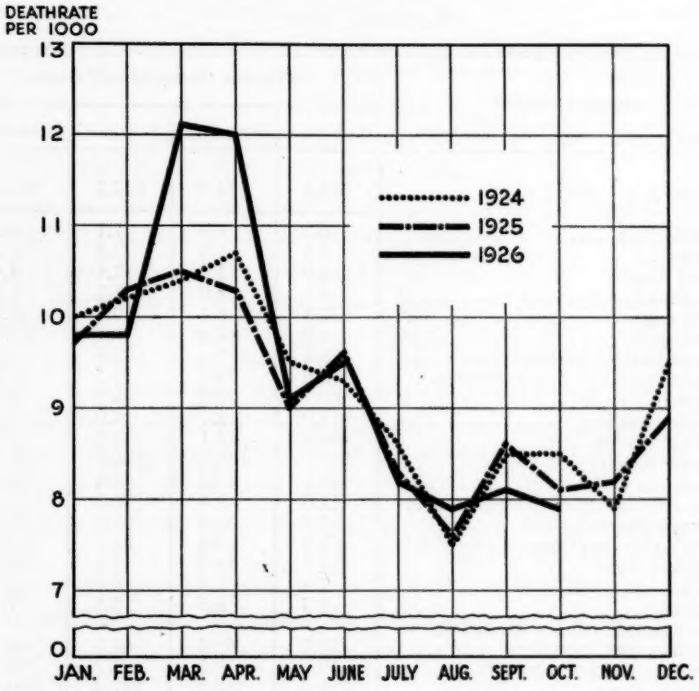
DEATHRATE PER 1000
IN SPECIFIED MONTHS OF
1924, 1925, 1926

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



	1924	1925	1926		1924	1925	1926
JAN.	10.0	9.7	9.8	JULY	8.6	8.3	8.2
FEB.	10.2	10.3	9.8	AUG.	7.5	7.6	7.9
MAR.	10.4	10.5	12.1	SEPT.	8.5	8.6	8.1
APR.	10.7	10.3	12.0	OCT.	8.5	8.1	7.9
MAY	9.5	9.0	9.1	NOV.	7.9	8.2	
JUNE	9.3	9.6	9.5	DEC.	9.5	8.9	

NOTE: Figures include mortality of infants under one year of age.

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